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Meat Inspection.

The thanks of the profession are due to the Rev. Frederick Lawrence, Hon. Sec. of the Church Sanitary Association. This gentleman attended the last meeting of the Yorkshire V.M.A. and made some very interesting and important statements which deserve the closest attention from veterinarians. It will be remembered that not long ago the Duke of Westminster headed a deputation from the Church Sanitary Association to the Board of Agriculture, and presented a memorial bearing 7,300 signatures. Their object was to obtain the assistance of the Board of Agriculture and the Local Government Board to a scheme under which no animal should be slaughtered and no meat be sold until after inspection by a veterinary surgeon. The reverend gentleman advised the Yorkshire Society to send a memorial similar to the one his Association had forwarded, and his last remark was—"They were trying to bring about an improvement in the meat supply of the country, and they would not rest until veterinary surgeons had the position to which they were entitled."

This question of meat inspection is certainly coming to the front, and our profession cannot afford to stand idly by, waiting for any appointments which may chance to come in the way. We must join hands with the bodies already moving, and help to guide the public to a proper appreciation of the necessity for some real control over the meat supply. We must also take care that we have amongst our members properly trained and educated men capable of undertaking the duties required in meat inspection. It is quite true that inspection of meat is one of the subjects now required at the final examination for the diploma. It is also true that a veterinary surgeon is by his ordinary training far ahead of any other class of men in acquaintance with, and knowledge of, the post-mortem appearances of disease in the domestic animals. But we cannot claim that many of us are experts equal to the veterinarians who in nearly all large continental towns are entrusted with the inspection of meat. We have not here the facilities for learning the business, and the suggestion of the Church Sanitary Association—"That one or two students should be sent abroad by the Government to study the question"—should not be hastily put aside by asserting that we have nothing to learn from continental arrangements. Students of Forestry are sent to Germany by Government to finish their education because we have no forests here on the German scale. Men possessed of a veterinary diploma would require only a few months attendance at a well organised abattoir to make them experts. No class of training—neither that of a doctor nor that of a butcher—can be compared with that of a veterinary surgeon for giving the necessary fundamental knowledge which ought to be possessed by anyone entrusted with the inspection of meat. By a short experience in a foreign abattoir the average veterinary surgeon would become an expert, and on returning home might safely claim to hold attainments for the office of inspector not possessed by any other person in this country. Even without such experience, the training imposed upon students before they can obtain a veterinary diploma makes the veterinary surgeon the only person in these islands capable of quickly qualifying for the office of meat inspector, when once he has the opportunity of completing his special work by experience in an abattoir.

In the Public Health Section at the last meeting of the British Medical Association the opinions of Medical Officers of Health were nearly all in favour of veterinary surgeons being entrusted with the inspection of meat. Some of these gentlemen are clearly not aware of the training now given to veterinary students. A few are under the delusion that continental veterinary surgeons are superior to our men in sanitary and hygienic knowledge. This is utterly wrong. Where we are behind them is only in such specialised divisions of work as can only be perfected in properly organised places—in for instance, laboratories and abattoirs. In general hygienic matters we are certainly well in front. In grasp of the general subject of preventive medicine we are surpassed by no veterinarians in the world. All we require is the opportunity to apply our scientific and practical knowledge to any division of the great subject of health and disease in animals. No man can be an expert swimmer if he is not allowed to go into the water, and no man can be an expert meat inspector if no opportunity is offered him to obtain experience.

The inspection of meat is a simple matter if the public is to be only protected from the grosser horrors due to putridity, or to such forms of slaughter as are adopted when animals are on the point of death. If disease is to be detected, the inspector must have pathological knowledge and clinical experience of the morbid changes which take place in the animal body. Only veterinarians possess this knowledge, they offer it to the public and the loss is mutual if it be neglected. As *The Times* said, in reference to the transmission of tuberculosis from animals—"It surely is the duty of the public to render operative any knowledge which may be placed at their disposal. . . . They are themselves the chief sufferers by their failure to do what may reasonably be expected of them."

CASES AND ARTICLES.

ACUTE RHEUMATISM.

By B. Freer, M.R.C.V.S.

The subject, a well-bred 7 years old harness mare, the property of a corn factor, her work consisted in running to and from the railway station three days a week, the other three drew the owner to neighbouring markets. Her diet consisted of oats and Canadian peas *ad lib.* and good hay. She had been noticed to go lame behind for several days, and the owner consulted a local oracle, who diagnosed spavins, and recommended the application of a proprietary blister as soon as she could be spared; however, she got rapidly worse and I was requested to attend.

On arrival I made a careful examination, and found that she moved with great difficulty in walking (trotting was out of the question), turning round she gave vent to a prolonged moan. The pulse was 50, temp. 104, bowels constipated and fæces covered with mucus, mouth slimy and breath offensive.

Diagnosis—acute rheumatism, principally affecting the lumbar region, neck, shoulders, and muscles of the chest.

At once administered aloes, 6 dr. in ball, and a draught containing spts. æth. nit. ℥iij., liq. amm. acet. conc. ℥ss., chlorodyne ℥j.; had nearly the whole of the body well rubbed with liniment camphor, and afterwards thoroughly wrapped her up in blankets, ordered usual mash diet until physic acted, and sent a mixture containing potass. bicarb. and tinct. aconiti, which she readily took three times daily in the drinking water.

I saw her two days after, the bowels had freely responded to the purgative, but there was little or no abatement in the symptoms. Changed medicine to sodii salicylas ℥iij. three times daily in water, and belladonna electuary also to be given as an anodyne three times a day. Other treatment as before.

On my next visit I found temp. 101.0, pulse about the same, hard and wiry. Movement better as regards the hind quarters, but the mischief apparently concentrating towards the region of the chest and shoulders, on removing the wrappings I was at once struck with the appearance of the chest anteriorly; it looked quite pinched in, whilst the pectoral muscles stood out in hard knots. As the owner begged of me to stick at nothing providing the mare could be saved I at once went in for heroic treatment. Having passed a broad tape seton about 10 inches long straight down the front of the chest and dressed it with strong liniment tereb. I freely applied over the chest, points of shoulders, and sides, freshly prepared oleum cantharides, and left instructions that for the remainder of the day she was to be carefully watched, also changed the medicine to liq. arsenicalis ℥j. twice daily.

Three days after I found that the blister had not only acted well but had produced diuresis, evidently to the advantage of the patient. She not only looked better, but both pulse and temperature had dropped nearly to normal. The seton was already discharging freely, but needless to remark her movements at present had not much improved. Ordered grass diet with about one feed of oats daily and continued the medicine.

At the end of a fortnight cut out the seton, had the blistered surface oiled, and sent the mare to gentle exercise.

In another month she was sound and fit for work, and now is apparently none the worse for her very severe attack of rheumatics.

SUNSTROKE (?) IN HORSES.

In these days when the popular mind is fast tending to the belief that every ailment is due to a bacillus, the following cases may be worth recording, as in the opinion of the writer they shew the great influence which the weather has in causing disease.

The cases occurred in the afternoons of the 25th, 26th and 28th September, days when the thermometer registered 85, 82, and 80 degrees in the shade. The animals affected were all of the same class, viz: trotting vanners. The attack came on after they had travelled about four or five miles at the rate of six or seven miles an hour, at least the drivers say so, but it is probable the pace was faster. The first case, which occurred on the 25th, was not seen until over an hour after it had fallen. It was then breathing hurriedly and loudly, the pulse could be easily felt, was very quick and strong, did not indicate speedy dissolution; the surface of the body was dry and very hot to the touch, mouth very hot, and muscular quiverings all over. The animal occasionally dashed himself about, apparently unconscious, and died within a very short time after being seen.

The second case, which occurred the next day, was not seen until after the attack had partially passed off. The driver said he observed something amiss and pulled up, when the animal staggered about and fell. He lay on the ground struggling occasionally for about half an hour, when he got up with assistance and walked a few yards into a loose box. A tottering gait, the pulse and respirations slightly quickened, were all the abnormal symptoms the animal presented three hours afterwards; these passed off in a few days and the animal returned to work.

The third case was seen soon after it fell. In this case also the surface of the body was dry and hot to the touch, and there were muscular tremblings and hurried respirations; the eye had a dull fixed look and the pupil appeared dilated; the animal occasionally struggled violently. It was removed in an ambulance to a loose-box but died in about an hour after it was first observed.

Mr. R. Spooner Hart, of Calcutta, contributed an interesting article on this subject to *The Veterinarian* for November, 1894. He appears to have studied the disease carefully, which is of common occurrence there in hot weather. His theory of the cause of this is worth reproducing—he says:—

"One may start with an animal in many cases that already has his body temperature elevated, and par-

ticularly so if he has been standing exposed any time before starting, and before the horse has been driven far the heat and the exertion bring the body temperature up to 107° or 108° or more, as the case may be. As we are aware, the temperature of the body is the resultant of two processes: (1) those by which heat is gained; (2) those by which it is lost. The balance which ordinarily exists between the two processes is upset in these cases. The heaters have it all their own way; the coolers are insufficient to meet the demands, and the temperature runs riot. The hot humid atmosphere, the temperature of which may at the time be higher than that of the body, is insufficient (notwithstanding the skin is bedewed with profuse perspiration) to hold the body temperature in check, which frequently rises in such cases beyond the limit of the ordinary thermometer, which is marked to register 110°."

This is without doubt the correct view of the cause of the malady—not altogether exposure to the rays of the sun, but continued muscular exercise when the temperature of the body and the atmosphere are high. His treatment, by the application of ice, cold water, etc., for the head and body, appears rational and likely to be successful. He does not mention the post-mortem appearances and for comparison these would have been valuable. At the examination of the two fatal cases noted above there was an absence of any organic lesion. The heart was empty, and the lungs shewed no sign of congestion; even the usual post-mortem infiltration into one lung was absent, both lungs being equally spongy and light; in one of them a little frothy mucus was in the trachea and bronchi. It should be mentioned that the post-mortem was made under very unfavourable circumstances, and possibly something may have been overlooked. The brain was not examined. Perhaps some of your other contributors will send their experience of the effect on horses of the recent almost tropical heat in London.

CYCLOP.

ON ABDOMINAL SURGERY.

By PROFESSOR J. MACQUEEN, F.R.C.V.S.

(Abstract of paper read at the meeting at Birmingham, July 25th, 1895.)

It is conceded generally that in dogs, swine, and cattle the peritoneum can be opened, wounded, and mutilated, without danger to life, or even incurring serious symptoms. But this confidence is usually withheld from similar wounds in horses, because of the supersensitiveness of the peritoneum to inflammation. Being unwilling to admit this peculiarity, which appears to me less real than imaginary, I shall not attempt to explain it. My fears concerning wounds of the horse's peritoneum were considerably relieved by seeing Farmer Miles castrate an abdominal cryptorchid in 1878, and later experience of Miles' method has done nothing to shake my belief in the possibilities of abdominal surgery. Having more faith in fact than theory, I venture to give abstracts of cases that show—perhaps better than experiments—the injuries the peritoneum will support without fatal consequences.

[A large number of cases are given of which we select the following as typical.]

GAULLET treated a horse with a wound over seven and a half inches long, caused by a scythe. Portions of double colon and small intestine protruded. The colon was wounded for a length of two inches, and its contents escaped. The small intestine was replaced, the wound of the colon closed by a zigzag continuous suture, and the abdominal wound sutured in layers. Complete recovery occurred in six weeks.

LEBLANC, on February 4th, 1831, saw a horse that had been struck in the right flank by a cabriolet shaft, which penetrated nearly a foot into the abdomen, where it remained fixed in the wound. On withdrawing the shaft, blood flowed freely, and required a strong compress to stop it. At each expiration either blood or a blood-tinged fluid was forced from the wound, which gaped and admitted air. Leblanc explored the wound, felt the undulatory movements of the bowels, and found the abdomen almost filled with fluid. As far as possible this fluid was removed, and the wound was closed with *dossil sutures*. Next morning the horse appeared very weak, with head resting on the manger, body leaning against the stall, and abdomen much distended. Leblanc untied the sutures, when half a pint of fluid escaped. He tried to get rid of more fluid by compressing the horse's sides, but much still remained. He thought of suction, but decided to make another opening lower down. He therefore incised the wall to the right of the umbilicus, and introduced a tube; fluid escaped, but not in large quantity. He altered the direction of the tube from time to time, and removed altogether about two pints of fluid. The tube was left in position, and the wound in the flank re-sutured. On the 7th the discharge from the tube was thicker and rust-coloured, on the 8th it was milky, and on the 9th it was pus-like and quantity increased. From the 10th to the 13th, purulent fluid continued to fall from the tube. General condition of patient improved. Discharge continued unaltered until the 25th, when the horse—much better—walked without tottering. The horse was discharged from the infirmary and put to exercise on May 25th, and returned to ordinary work early in June.

B. KETTLE attended a colt with abdominal wound; bowel lacerated and contents escaped. Sutured gut with fine white silk, and forced bowels back into abdomen. Closed parietes with metallic sutures. Complete recovery in a month. Kettle remarks that in 1843 he had a case of rupture, with protrusion of omentum and intestine, which was swollen and thickened. Treated by fomentations and scarification; recovery followed. Kettle also refers to the general dread of peritonitis in such cases, and thinks the danger of this complication has been greatly magnified.

THOMSON says that while castrating a pig "the animal sprang up and the scalpel was plunged deep into the belly." After operation, Thomson saw fæces escape from the wound in the side. The greater part of the small bowel had to be drawn out before the wound in it was seen. The knife had divided the gut almost through, and wounded the mesentery. The gut and mesentery, nicely adjusted, were sewn together and replaced, the wound was sutured, and the pig soon recovered.

The foregoing cases by no means exhaust the list of recorded abdominal injuries in horses and cattle. Those given may serve to substantiate the contention that the horse is not specially susceptible to peritonitis from wounds of the abdomen.

LAPAROTOMY OR ABDOMINAL SECTION.

It is said that Henon (1800), professor at Lyons Veterinary School, frequently performed this operation, but particulars of his cases have not been published. In this country laparotomy was performed on a mare by King, a veterinary surgeon of Stanmore, in 1829. The next, and to this day the only successful laparotomy performed on

a horse affected with intestinal obstruction, is that recorded by Félizet, of Elbœuf. In June, 1849, Félizet was called by a miller to see a horse, about nine years old, that had been affected with colic for about sixteen hours. Two or three times within four months the horse had shown symptoms of constipation. Clysters had been given, but no other remedy. Rectal examination discovered a concretion, as large as a child's head, at the beginning of the floating colon. Félizet was positive of the existence of the calculus. As death seemed the only possible result, the miller was informed that his horse could not live much longer. But a conversation between Félizet and a farmer probably saved the animal's life. Five days before, the farmer's colt in jumping a hedge had opened the abdomen and torn the point of the cæcum. Félizet treated the wounds, but gave no hope of recovery. The farmer now told him that the colt had made wonderful progress; and on learning this, Félizet was struck with an idea as bold as it proved to be fortunate. At once he decided to return to his patient, the miller's horse, open the flank and extract the calculus. Unaided by anæsthetics and antiseptics, he performed laparo-enterotomy. The horse was thrown on the left side; the upper hind leg, unhobbled, was drawn backwards and lashed to a stout pole. The skin of the right flank was incised longitudinally. the muscles were divided with forefinger and thumb, and the peritoneum was opened with the point of a bistoury. The left hand with fingers extended within the abdomen prevented protrusion of bowels, while the right hand in the rectum pushed the obstruction towards the flank. Acting together, the hands passed the tumour through the wound. The right hand was now withdrawn, and cleansed by an assistant. The distended bowel was gently wiped, and incised two fingers' breadth from the mesentery. To facilitate extraction the concretion was reduced by separating its fæcal crust. A furrier's suture was used for the wound in the gut, the muscles were stitched in layers, and a strong quilled suture closed the wound in the skin. Sweating profusely, the horse was allowed to rise. He was poulticed on the loins and bled six times at intervals of three hours, twenty-one pints altogether being withdrawn. During the next four days he drank from twelve to eighteen pints of water every twenty-four hours, but he refused to eat either hay or grass. He groaned when moved, was dull and very stiff. Two days later his appetite returned, and by the ninth day he fed well, looked bright, and moved freely. The wound healed rapidly. In about a fortnight he was put to work on the land, and in September of the same year he was bought for 1100 francs by a Paris merchant, who was very much pleased with his purchase.

It is to be regretted that the report does not contain particulars of the length of the incision, and of the material used in stitching the bowel. A furrier's suture implies the passage of the silk or other thread through the whole thickness of the gut, and as a consequence considerable risk of leakage.

To relieve obstructed bowel in the horse, laparo enterotomy was performed by Vet.-Capt. Smith (No. 34) in 1887, by Messrs. Dollar, Rickards, and Rogers (No. 35), and by Mr. Garry (No. 36) in 1894. These cases did not recover, but the reports show that death was mainly attributed to the operation having been too long delayed.

(A number of illustrated cases are quoted).

Of laparotomy in dogs little need be said. Always a favourite of the physiologist, for many years the dog has been almost indispensable to the surgeon. The various abdominal operations—'ostomies, 'otomies, and 'ectomies—now practised with commendable results on man, were first tested on the dog; and when it is remembered that nearly every organ inside man's abdomen has been advantageously wounded by the surgeon's knife, some estimate may be formed of the value of the dog in experimental surgery. Nearly a century ago Travers, Astley Cooper, and Thomson—to mention only surgeons of this country—demonstrated the feasibility of laparo-enterotomy on dogs. But it does not appear that the publication by Travers, in 1812, of "An Inquiry into the Process of Nature in Repairing Injuries of the Intestines," induced many veterinary surgeons to try the operation. This indifference to operative surgery in veterinary practice is unaccountable. Perhaps it is only "another of those innumerable instances in which veterinarians have searched not and remained uninformed."

Diagnosis.—Abdominal diseases amenable to surgical treatment, with few exceptions, may be diagnosed in dogs by manipulation, in cattle by rectal exploration or by rumenotomy, but in horses diagnosis is extremely difficult. The size, disposition, and relations of the viscera, and the common symptoms they provoke when diseased, give little hope of greater accuracy in diagnosis so long as only current methods are pursued. In the future, exploratory incision may be reasonably expected to give some assistance. When it has been shown that the peritoneum can be opened without risk to the patient, or without adding to the gravity of the disease that may call for relief, present difficulties will diminish, and in time perhaps disappear. This view, in face of past and present practice, may be too sanguine; but with anæsthetics to suspend movement, and antiseptics to prevent contamination of surgical wounds, expectant treatment and dangerous delay may yet give place to more active measures.

Assuming that cases of volvulus, invagination, internal herniæ, and obstruction by bands, pedunculated tumours, or by concretions, can be treated by surgical interference the question arises: How may these conditions be distinguished from other abdominal affections? At once I confess my inability to give a satisfactory answer. The history of the patient; the character of the pain, whether intense and continuous or subacute and intermittent; distension, local or general; constipation, persistent or interrupted; the action of eserine; the posture of the patient; backing; straining; the quantity of urine passed; the rejection of clysters; expulsion of flatus; and the symptoms sometimes afforded by palpation, percussion, and auscultation, merely suggest a possible cause—all are fallacious and unreliable in the diagnosis of the diseases just mentioned. If examination *per rectum* gives more assistance, it does not always yield satisfaction. The height of the operator and the length of his arm should be considered as well as the state of the horse's bowels. In a healthy horse, fifteen hands high and of medium coupling, the hand may reach the cœliac axis and the last rib. In a long-loined sixteen-hands carriage horse, lying on his right side, I have felt without difficulty the border of the spleen, the last rib, and the left kidney; but in the standing horse I have never reached the spleen. Experiment warrants the assertion that an imaginary vertical plane falling from the first lumbar vertebra to midway between the xiphoid and umbilicus represents the forward limit of rectal exploration. Employing the left hand for the right half and the right for the left half of the abdomen, all the viscera behind this boundary may be examined more or less satisfactorily—in the healthy horse. In abdominal disease, especially in obstruction, the intestines are often crowded towards the pelvis, and frequently the hand cannot pass onwards in consequence of straining and pressure from distended bowels. But when the hand has reached the flank it may, and sometimes does, discover displacements, volvulus, or invagination; recognise and remove concretions: ascertain the condition of the contents of the colon, cæcum, floating colon, and small intestine; and in herniæ distinguish and liberate omentum and bowel. Cases that give no sign to exploration are uncommon, and without this precious aid diagnosis, whether positive

or negative, is doubtful. In this, as in other diagnostic efforts, the spirit of the practitioner dominates procedure. With faith in possibilities, rectal exploration may be tried again and again, and information may be gained at every investigation.

Laparo Enterotomy.

Practical acquaintance with surgical wounds of the horse's flank had convinced me that the bowel could be withdrawn from the abdomen, exposed for some time, manipulated and replaced, without danger to life, in spite of almost total neglect of antiseptic precautions. But I was not sure if the horse would tolerate incision and suture of the gut. To determine this point, and to ascertain the best way to operate for the relief of intestinal obstruction, I commenced, in February last, a series of experiments on horses. I will give particulars of the materials and instruments employed, and a short description of the procedure, with the clinical reports of two or three cases.

(A description of the materials, instruments &c. here follows.)

Preparation for Operation.—Before casting the horse, the flank from spine to groin and from haunch to sixteenth rib is clipped and washed. When the horse is under chloroform, the flank, within two or three inches of the boundary marked by clipping, is shaved and disinfected. While these preliminaries are proceeding, the pails and trays are arranged and filled. All the solutions must be warm, and the water used in their preparation passed through muslin. Pail No. 1 is filled with 5 per cent. and pail No. 2 with 2½ per cent. solution of carbolic acid. The trays are filled with hot solution of the same strength as pail No. 2. The sponge cloths are placed in No. 1, and kept there until required. The sponges and tarlatan, after having been squeezed as dry as possible, are placed in No. 2. In one tray are placed the milliners' needles, twelve of which are threaded with twist No. 1; another tray contains scissors, forceps, and scalpel; and the third contains reserve instruments, suture needles, and twist Nos. 3 and 6. Pail No 3 is filled with hot water for rinsing hands and instruments; and pail No. 4 is filled with boiling water, which is protected from dust and allowed to cool. This water will be required to wash the bowel after suture.

Abdominal Incision.—The linea alba offers the least vascular and shortest route to the interior of the abdomen. Through an incision of the white line any organ within the cavity can be felt, the small and large intestines in part can be seen, and to some extent portions of these viscera can be withdrawn; but the colic mesentery is too short to permit the first part of the floating colon to pass through the wound. Besides, if the incision is made at this point the wound does not heal rapidly, and adhesion between its peritoneal surface and omentum or bowel is a probable complication. In the horse, incision of the abdomen an inch or two to the right or left of the linea alba is equally objectionable. When the floating colon has to be opened, I prefer to reach the bowel through the flank. In opening the flank I make three wounds before touching the peritoneum. The first divides the skin, fascia, and *external oblique muscle*; the second the *internal oblique*; and the third the *transversalis*. The first starts at a point four inches below the lumbar transverse processes, midway between the angle of the haunch and the last rib, and passes downwards and forwards for seven or eight inches. The forward direction of this incision is opposed to all teaching, but its advantage is conceivable. The upper hind limb is unhobbled and drawn backwards. The wound gapes and exposes the internal oblique muscle, which is then cut with scissors in the direction of its fibres. A similar opening is made in the transversalis. The third wound exposes a layer of fat which is lined by peritoneum; this is pierced with the finger, and the opening is enlarged with scissors in the direction of the transversalis wound.

Incision and Suture of the Bowel.—In Félizet's case the gut was opened two fingers' breadth from the mesentery. So far I have only opened the bowel at the middle of the longitudinal band—where the wall appears strongest and most capable of supporting sutures. With sharp-pointed elbowed scissors the gut can be punctured and the wound extended without the slightest difficulty. The wound is closed with sutures of prepared Chinese twist No. 1. There are many methods of suturing bowel wounds, but Lembert's is the only one of which I have experience. Sutures applied by Lembert's method pass through both the serous and muscular coats; the mucous membrane must not be punctured. The needle enters one-quarter inch from wound, passes through muscle for one-eighth inch, then pierces serous one-eighth inch from the edge of the wound. It is then carried across the wound, reinserted one-eighth inch from edge, passed through muscle for one-eighth inch, and brought out one-quarter inch from the wound. The sutures are placed one-eighth inch apart and tied separately. The ends are shortened to within one-quarter inch from the knots. Degive has improved this method by making the sutures continuous.

(The operative procedure is next described in detail.)

Notes of Cases.– *a*. An aged brown pony gelding in poor condition; purchased three weeks before operation. Feeds well, but masticates imperfectly. Urine normal in appearance. February 15th.—Temp. 99·4; pulse weak, 36; resp. 6. 16th.—Temp. 99·7; pulse 36; resp. 6; skin washed and disinfected. 17th (date of operation:—Temp. 99·1; pulse 36; resp. 6. 11.15 a.m.:—Pony cast, fixed, and chloroformed (three ounces consumed during operation). Hair removed from under part of abdomen, and skin disinfected with hot (5 per cent.) solution of carbolic acid. Incised linea alba for five inches through skin, subcutis, and fibrous tissue to fatty layer, of which a piece was excised. The peritoneum was pinched up with forceps, punctured with scissors, and cut the full length of superficial wound. A loop of floating colon was withdrawn, and incised along the muscular band for three inches and a half. Blood oozed from the edges, but this was soon stopped by warm sponges. The wound was closed with twenty-two fine silk and six chromic gut sutures, applied by Lembert's method. Having tied the sutures and shortened the ends, the bowel was sponged, tested for leakage, and replaced in the abdomen. The bowels underlying the wound were swabbed, and the abdomen was closed with eight strong silk interrupted sutures, passed through the whole thickness of the wall from peritoneum to skin. The wound was further secured by seven fine silk stitches, placed in the skin between the strong sutures. Temperature at close of operation 95·2 F.; half an hour later 94·8, and in ten hours it was 103. The wound was dusted with iodoform and tannin, and covered with carbolised wool and gauze maintained in place by roller bandages.

18th.—Morning: temp. 102·7; pulse imperceptible; resp. 14.

19th.—Morning: temp. 102·3; pulse 33, weak and intermittent; resp. 30 and blowing; mucous membranes dull red; discharge showing through bandages. Has eaten very little.

20th.—Morning: temp. 103·6; pulse 60; resp. 50, blowing a good deal; shows difficulty in swallowing, throat painful.

21st.—Temp. 105·2; pulse 80; resp. 32. Has eaten some hay. Noon: uneasy, stepping backwards occasionally. (Fear adhesion of bowel to abdominal wound). Dressing examined and found dry.

22nd.—Morning: temp. 106; pulse 104; resp. 80. Blowing, sweating, and very uneasy. Breath very offen-

sive. Will neither eat nor drink. Wound still dry. Noon: destroyed by chloroform.

Autopsy.—Wounded part of abdominal wall excised and examined; sutures intact; cutaneous edges united in some places; peritoneal edges closed and puckered, surface bright red and omentum adhering slightly to wound. Removed wall and exposed viscera fully; omentum, traced to stomach, unaltered; no fluid; peritoneum—parietal and visceral—glistening and apparently healthy. Floating colon examined, operation wound found four feet from double colon. Serous coat in front and behind sutures marked by small bright red patches. Colon was now tied in two places and contents forced against the sutures; no leakage. All but four sutures intact. Four chromic gut sutures missing. At this place wound was slightly opened by traction on serous membrane, when oozing of a milk colour appeared. Mucous membrane at wound appeared retracted and roughened. Stomach, small intestine, cæcum, and double colon healthy and more or less full of ingesta. Kidneys and liver normal; spleen marked by a few raised spots; bladder empty. Heart: ventricles show incipient endocarditis. Left lung enlarged by septic pneumonia, and at one place putrid. Right lung similarly altered at apex. Both contain a few hard tubercles.

b. Chestnut pony gelding about eight years old.

April 20th.—Temp. 100·2; pulse 33; resp. 9. 21st.—Morning: temp. 99·7; pulse 32; resp. 9. Cast pony and gave chloroform (six ounces and a half consumed). Shaved and disinfected right flank. Incised skin and external oblique downwards and slightly forwards. Wound seven inches. Unhobbled upper hind limb and drew it backwards. Broke through muscles to peritoneum, and checked bleeding and disinfected wound. Opened peritoneum with scissors and withdrew loop of floating colon. Incised the gut at muscular band for about three inches, and removed fæces. Washed the bowel and applied twenty-four Lembert's sutures of Chinese twist No. 1 Shortened ends; douched and returned bowel. Did not stitch peritoneum. Sutured abdominal muscles separately with carbolised gut, and closed the skin with strong twist. Inserted a rubber drainage-tube, and dressed the wound with iodoform, carbolised cotton and bandages, as in Case *a*. Temperature at close of operation 98·5; five hours later temp. 101·4, pulse 44. Ordered sedative electuary and laxative diet.

22nd.—Morning: temp. 101·5; pulse 35; resp. 16. Had passed fæces during the night. Looking well.

23rd.—Morning: temp. 101·9; pulse 34; resp. 16. Fæces coated with blood and mucus. Re-dressed wound and removed drainage-tube.

25th.—Temp. 101·9; pulse 38; resp. 42. Re-dressed wound and discontinued bandages. May 1st.—Temp. 101·6; pulse 36; resp. 20. May 3rd.—Temp. 99·8; pulse 40. May 13th.—Temp. 101; pulse 34; resp. 14 Destroyed by chloroform.

Autopsy.—Cutaneous wound healed except at lower extremity; peritoneal wound closed; transversalis and internal oblique wounds obliterated by fibrous tissue. An abscess existed within the external oblique muscle. Pressure forced pus through the unhealed extremity of cutaneous wound. Sutures secure, but somewhat relaxed. Colon examined for operation wound, which was found with difficulty two feet from double colon. Serous surface concealed by adhesion to colic mesentery. Somehow the gut had turned on its long axis and united with its own mesentery. Wound of mucous surface almost closed. All other viscera apparently normal.

c. Aged brown gelding, 15·2 hands, broken winded. May 10th.—Temp. 99·5; pulse 30, irregularly intermittent; resp. 10. 11th.—In afternoon, immediately before casting, temp. 101; pulse 38; resp. 9. Thrown and chloroformed (nine ounces consumed). Washed, shaved, and disinfected right flank. Incision seven inches downwards and backwards, subsequently extended for about three inches forwards and downwards. Unhobbled upper hind leg and drew it backwards, slit internal oblique and transversalis muscles in the direction of their fibres, and stopped all bleeding. Then pushed finger through fat and peritoneum, enlarged opening, passed hand in and brought out loop of small colon. Incised gut at muscular band to about three inches, removed fæces, cleansed the lining and applied twenty-one Lembert's sutures of prepared twist No. 1. Suture completed, the bowel was well washed with warm water and returned to abdomen. Closed muscular wounds with a few interupted sutures of fine twist, and the skin with fifteen sutures of No. 6 prepared twist. Temp. 100·4; breathing laboured. Wound dressed and bandaged as in other cases.

May 12th.—Temp. 102·4: pulse 54; resp. 34. 14th.—Temp. 102·6; pulse 50; resp. 32. 16th.—Temp. 102·8; pulse 72; resp. 16; symptoms of influenza, mucous membranes dull red, eyelids swollen, lips and sheath œdematous; frequently backing against the wall. 17th.—Temp. 102·7; pulse 44; resp. 16. 18th.—Considerably easier. 20th.—Temp. 101·3; pulse 54; resp. 16; wound re-dressed. 27th.—Temp. 100·3; pulse 48; resp. 24. 28th.—Out of danger; wound to be dusted occasionally with iodoform. Observation discontinued. Horse to be exercised every day. June 11th.—Destroyed by chloroform.

Autopsy.—Wound of skin healed except at drainage opening. Abscess within panniculus communicating indirectly with the drainage track. Deeper muscles closed; peritoneal surface attached to base of cæcum. Omentum adhered to surface of wound in colon. Mucous wound cicatrized. (After operation a small forceps was missing, and this instrument was found encapsuled and attached to the left abdominal floor). All the viscera—except the liver, which was spotted—appeared healthy.

Enterectomy.

Excision of part of the intestine.—This operation is indicated in some cases of invagination, "twist" or strangulation that cannot be reduced. Successful operations in cattle have been recorded by Brayn, Meyer, and Taccoen; and in dogs resection of the bowel experimentally has frequently been performed.

In operating on the small intestine of the horse, the abdomen may be opened at the flank or near the linea alba. The bowel is brought out and clamped in front and behind the obstruction, care being taken to apply the clamps over the sound bowel two or three inches from the strangulated part. Within two inches of the clamps along a line near to the attachment of the diseased segment, the mesenteric vessels are tied; the bowel is then detached from its mesentery, divided at two places, and removed. The continuity of the gut is restored by continuous or interrupted sutures passed through serous and muscular coats of the inturned ends. The mesentery from which the bowel has been separated is carefully folded to the right or left, and secured by sutures of fine twist placed at the borders of the fold, or a piece of mesentery can be excised and the edges united by continuous suture; but whether folded or excised no gap should be left between mesentery and bowel. If clamps are not employed, the ends of the gut should be drawn over a piece of trachea or decalcified femur, and the edges inverted before applying the sutures. To protect the wound and support the sutures, Senn suggested that a bit of omentum should be applied and stitched to the bowel. But stiches are unnecessary, as the omentum readily adheres to the wound. In the human subject, continuity can be attained by lateral implantation and by lateral apposition as well as by end-to-end approximation. In the first, the posterior end is closed by continuous suture, and a hole is cut in the side of the bowel. The anterior end is then passed for an inch into the

opening, and fixed by sutures. In the second, anastomosis is effected by means of Senn's perforated bone plates, or slices of raw turnip. The ends of the gut are turned in and closed; each is then slit open at the side about two inches from the end, and a bone plate or a slice of turnip to which sutures have been attached is inserted through the opening. The sutures are then passed through the wall of the gut and tied together to maintain the serous surfaces in apposition.

A metal "button," designed by Dr. Murphy of Chicago, has been recently introduced for intestinal approximation in man. Many advantages have been claimed for this contrivance. Reading of its successful employment by many surgeons at home and abroad induced me to give it a trial in the horse. I procured the largest button made for the human subject, and soon found my opportunity. The horse was cast and chloroformed, and the usual antiseptic precautions were observed. The abdomen was opened two inches to the left of the linea alba, and the jejunum was brought outside. The bowel was divided, the ends and mesentery were secured by a running thread—according to Murphy's directions—and the button was inserted and closed. The abdominal wound was sutured, dressed, and bandaged.

The temperature after operation was 95·5, and four hours later it was 102·9. Early next morning symptoms of abdominal pain appeared. Temp. 103; pulse 36, wiry; resp. 24. The patient was uneasy, looking round to his flank, lying occasionally and rolling over slowly from one side to the other. These symptoms continued without aggravation till death, which occurred thirty-nine hours after operation. On removing the skin, an abscess with inspissated contents, lying against the peritoneum, was discovered in the right flank. This had not been observed at the operation. The abdomen contained more than a gallon of turbid fluid, and the bowels were congested throughout. Murphy's button was secure, the peritoneal surfaces adhered but were not united. The bowel in front of the button was blocked and distended for nine inches, and behind the button the bowel was empty. The mucous membrane of the distended portion was inflamed, but in front and behind the obstruction it was normal. The liver was soft, flabby, and very pale; the spleen, kidneys, and heart appeared healthy, and the lungs congested. The abdominal wound was satisfactory, muscular incisions closed, cutaneous sutures all in position. No sign of suppuration.

Rumenotomy (Laparogastrotomy).

Incision of the rumen and abdominal wall.—The origin of this operation is unknown. Probably it was suggested to an operator who had experienced difficulty in treating tympanites, to enlarge the punctured wound, and remove some of the contents of the distended stomach.

To relieve plenalvia, the condition for which rumenotomy has been mainly performed in this country, Steel of Biggar, operated successfully on a cow in 1834. Youatt, while commending Steel for his decision in the case, discourages the operation, and advises the speedy preparation for the butcher of any beast "whose paunch has been distended to any considerable degree . . . . ." This note of warning, appearing as it did in one of the volumes issued by The Society for the Diffusion of Useful Knowledge—works widely read then, and, as some think, too often consulted now—rather hindered surgical interference in many cases. Horsburgh, in *The Veterinarian* for 1842, complains of Youatt's advice, and of its tendency to damage veterinary practice by encouraging owners to sell sick cattle rather than risk treatment; and states that he never hesitates to operate, and in no case has he seen the least apparent bad result either as to calving or feeding. In this communication Horsburgh gives particulars of his first rumenotomy (1836). He incised the left flank two inches below the lumbar transverse processes, and extended the wound downwards for five inches; fixed the stomach to the abdominal wall, and passed his hand through rumen and reticulum, and as far as possible (half-way) into the omasum. To prevent passage of food into the peritoneal cavity he sutured the rumen, muscles, and skin together; and covered the wound with adhesive plaster and a bandage.

Since 1842 few cases of rumenotomy have been recorded. One is given in vol. vi. of *The Edinburgh Veterinary Review*, and another in *The Veterinarian* for 1894. This remarkably meagre list would seem to show that rumenotomy is seldom performed, or that the operation is generally satisfactory.

The operation need not be described, but a few points, sometimes discussed, may be noticed. The flank should be clipped and disinfected, then incised downwards and slightly forwards. To prevent peritoneal contamination by food, the stomach should be fixed to the abdominal wall before or immediately after opening the rumen. A strong suture passed through the last intercostal space and tied over the last rib will maintain the stomach in position while the lower angle of the gastric wound is being secured. The stomach should be closed by Lembert's suture's of strong prepared twist; the muscular wounds by continuous and the skin by dossil sutures supported by a pitch plaster.

It remains to be said that the results of rumenotomy are not always gratifying, In aged animals, especially when operation for impaction has been delayed, recovery may be protracted, and in milch cows extremely unsatisfactory, because of the lessened secretion of milk.

Cæsarean Section (Laparohysterotomy).

The extraction of the fœtus through wounds made in the abdominal and uterine walls.—This operation is indicated, though not always performed, when delivery by the natural channel is impossible in consequence of insurmountable maternal or fœtal difficulty. Introduced with the object of saving the young, the operation at first was only carried out on the dead female. Improved methods and increased confidence, as well as the desire to relieve suffering, suggested the operation on the living with the hope of saving both mother and young. But in human practice few surgeons were bold enough to undertake an operation which had been condemned as cruel and unchristian, and some of those who performed it did not care to own their work, probably because the result had always been fatal. In one city still famous for the achievements of its surgeons not a single case was successful in a hundred years, and at Milan sixty-two operations yielded only three recoveries.

It is interesting to note that, according to Dr. Greig Smith (No. 56), one of the earliest successful Cæsarean sections was performed in 1500 by a sow castrator, who, being dissatisfied with the efforts of thirteen midwives and several surgeons, operated on his own wife and saved both mother and child. Before the employment of antiseptics and modern methods the mortality of Cæsarean section was seldom less than between 75 to 80 per cent.; but since 1860 the results have become more and more commendable.

Recommended by Brugnone and Bourgelat, Cæsarean section has occupied a place in veterinary practice since the early part of this century. The operation as recorded has been performed fifty-one times altogether—on five mares, twenty-one cows, seven sows, two ewes, and seventeen bitches. Of the mares three were killed, one died, and one survived. Eight of the cows died, seven were killed immediately, or soon after operation, and six recovered. Six of the seven sows recovered, and of the bitches four died and thirteen recovered from the operation. Franck mentions forty-eight cases, twenty-five of which were unsuccessful; and St. Cyr and Violet in their *Traité d' Obstetrique*, 1888, give a summary of forty-

one cases with twenty-eight deaths. These statistics, it must be confessed, are not encouraging, and at first view tend to hinder rather than promote confidence in the operation; but closer examination will show that most of the reports belong to a time antecedent to the employment of antiseptics in veterinary practice.

In performing Cæsarean section, chloroform should be given, and the flank should be prepared and incised as in laparotomy. The incision should measure, according to the case, from five to sixteen inches. Having exposed the womb, it should be incised on its upper surface, and the wound extended by probe-pointed scissors. The fœtal membranes if still intact should be ruptured; and to prevent soiling of the peritoneum a piece of mackintosh cloth should be spread over the lower part of the abdominal and uterine wounds. If the cord can be reached it should be tied and divided before the fœtus is removed. In the bitch, as suggested by Degive, advantage will be gained by bringing the wound as far as possible out of the abdomen before incising the horn. After extracting the fœtus the membranes should be separated and withdrawn through the vagina if possible. The uterine wound should be closed by Lembert's sutures; this done, the womb and adjacent viscera should be douched with warm water that has been boiled. Excess of fluid is then removed by aseptic sponges, and sutures are placed in the abdominal wound, which is subsequently dressed and bandaged in the usual way.

In hysterectomy, excision has been effected by the ecraseur and by the knife, with ligature of strong twist secured by a Staffordshire knot. The stump may be allowed to drop back into the abdomen, or it can be sutured with the wound of the flank, and a few days afterwards set free.

Herniolaparotomy.

Abdominal section for the relief of hernia.—"Gut-tie," or pelvic hernia in oxen, is the condition for which this operation has been most frequently performed. At one time cases of "gut-tie" were not uncommon, but since 1860 very little has been heard of the disease. In 1795 Mr. Harris (No. 62), a Herefordshire farmer, in a communication to the *Repertory of Arts and Sciences*, blames the erroneous method of castrating calves then pursued in Herefordshire as the chief cause of the production of the hernia, and endeavours to explain how the accident occurs. He states that "the part which is tied is the jejunum at its turning from the left side to the right; there the bow of the gut hangs over the bow of the *vas deferens*, which by a sudden motion of the beast forms a hitch or tie of the string." Harris operated on animals from three months to nine years old. He opened the left flank under the third lumbar vertebra, introduced his hand, and divided the cord with a small curved ring knife, like that sometimes used in embryotomy.

Harris (1795), Anger (1839), and Walker (1858), describe the operation. From Walker's description I take the following:—"The animal, placed in a stall, is kept standing with his right side against the wall, hing legs tied together above the hocks. An incision is made on the left side, midway between the antero-inferior spinous process of the ilium and the last rib, in a line with the fibres of the internal oblique muscle, through skin, muscles, and peritoneum, large enough to admit the *left* hand, which is then passed upwards and backwards over the rumen to the right side, where the strangulated part may readily be felt. A small probe-pointed bistoury is then introduced, and the vas deferens divided. Having ascertained that the strangulated bowels are entirely liberated, three or four interrupted sutures should be passed through skin, muscles, and peritoneum, and the animal released."

Gastrocentesis.

Piercing the rumen for the relief of tympanites in cattle and sheep has been practised in all countries since very early times. The operation performed with trocar and cannula through the left flank is familiar, simple, and generally successful. A few cases have been recorded in which puncture was followed by peritonitis induced by escape of gastric contents into the peritoneal cavity.

Paracentesis Abdominis.

Tapping the abdomen for the evacuation of ascitic or other fluid. This operation, which is neither difficult nor dangerous, though rarely required in horses, cattle, or sheep, has been frequently performed on dogs. Palliative rather than curative paracentesis gives the patient ease, and sometimes lengthens life. The puncture may be made in either flank. The linea alba should be avoided, because punctured wounds of that part heal slowly. An instrument of small calibre should be employed.

In connection with paracentesis I should mention that uterine and ovarian dropsy has been relieved by tapping through the flank. Steel of Biggar (No. 72) removed 102 quarts of fluid from the uterus of a cow, and W. Field (No. 78) operated twice on a mare, and withdrew altogether 8 gallons from an ovarian tumour.

Enterocentesis.

Puncturing the bowel in tympanites.—Vegetius (4th century) recommends abdominal puncture in the treatment of strophus or pain in the belly.

Enterocentesis was mentioned by Markham in 1656, and was pratised for the relief of tympanites in horses by Roem of Dresden, in 1776. Bourgelat and Chabert (1781) operated through the rectum, and Barrier and Herourd—somewhat later—through the right flank. For many years after its introduction, enterocentesis was viewed with much apprehension because of the occurrence of abscesses between the muscles of the abdominal wall and of the frequent deaths, which were often attributed—rightly or wrongly—to the operation.

In this country the operation was revived—if not performed for the first time—by Stewart of Glasgow, in 1836. But Stewart's limited experience, while it startled a few, failed to convince many. The old conservative treatment of flatulent colic prevailed; and even Stewart's enthusiasm was lukewarm, for he remarks in words as appropriate now as then:—"That an operation performed in France is not exactly the same to us as an operation performed in this country." Progress was slow, and complaints of competition were seldom made. Always busy in those days, veterinary surgeons did not encourage new-fangled operations. But treatment must vary with advancing knowledge. Since 1850 enterocentesis has gradually gained the confidence of practitioners everywhere as a ready, harmless, and frequentiy successful means of relieving tympanites in the horse. The symptoms of the condition are familiar; but sometimes one meets with a case in which the abdomen is much distended, and yet no gas can be found with trocar and cannula. In torsion of the large intestine, when hæmorrhage into the substance of the bowel has occurred, blood may escape from the canula. The operation, if it fail to relieve distension may assist diagnosis; more than once a horse has been promptly destroyed when blood instead of gas spurted from the cannula, and in every instance post-mortem examination revealed a hopeless condition of the large bowel.

The seat of operation is the right flank, but the left may be punctured.

The complications which attended enterocentesis many years ago were probably caused by want of care in selecting and cleansing the instrument. Trocars of excessive size and in all conditions were employed, and perhaps some of the unsatisfactory operations of the present day might be explained after examination of the instrument. The trocar and cannula, beyond the handle, should be somewhat flattened, and should measure roughly 6 inches by three-sixteenths inch. It should be warmed and

disinfected before, and cleansed and again disinfected after the operation. When employing a fine trocar and cannula I invariably first puncture the right upper-flank; and if no gas escape, re-introduce the trocar four to six inches below the first puncture. In many cases I have punctured both flanks at several places, and in one horse I punctured the right flank in seven places without complication. Beginning at the upper flank the trocar may be safely introduced at intervals of a few inches downwards behind the last rib to the abdominal floor.

EXTRACTS AND NOTES.

THE RESPONSIBILITIES OF MASTER HORSE SHOERS.

On Friday evening in the Religious Institute Rooms, Buchanan Street, Glasgow, Mr. Wm. Anderson, F.R.C.V.S., president of the Glasgow Master Horse Shoers Association, read a paper before a large attendance of members. Before beginning the paper proper the speaker dwelt for a short time on the work accomplished by the Association since its formation six months ago.

The question had been asked "What had the Association done?" It had constituted itself on a firm basis and also created a friendly feeling amongst its members. It had shown that at least 75 per cent. of the trade were willing to unite and do what lay in their power for the advancement and improvement of their calling. After some further speaking on the subject of the Association the Chairman said: There is a contract in connection with every horse that is shod, and whose terms may and do vary very much, but the ordinary terms are that for a certain sum of money the horse shoer shoes the horse in a tradesmanlike manner. No blame is attached to the horse shoer for any injury owing to the restiveness of the animal, but should the horse be injured by the vice of another horse in the smithy then there is blame attached to someone, but it is an axiom held by all past decisions that the owner of a horse or his servant should stand by whilst the shoeing is going on and do all in his power, the risk is his unless the horse shoer agrees to take all responsibility on himself, which is too often the case. Should the horse be injured by another horse which is standing without an attendant the owner of the unattended animal is to blame, and consequently held liable by the owner for the damage done, unless relieved by the shoer. I may here state that the opinions I give are gathered from decisions given in cases by county court judges, several of these decisions having been substantiated by the Higher courts. The Common Law is brought to bear on all such cases of damages. In the event of a horse being pricked it has been held that before damages can be recovered the owner of the horse must prove gross carelessness, recklessness, inexperience, or improper tools. A master horse shoer is responsible to the owner of a horse which has been injured by his workman, and he is also liable should the horse pick up a nail in his premises, unless the animal by its own act kicks over the tool box through vice. He is also responsible for injuries received through overcrowding in his forges or want of proper accommodation, or faulty construction of his premises. Should a man allow a horse affected with glanders or any other infectious or contagious disease to enter his premises knowingly, or without taking ordinary care to ascertain whether or not the animal is so affected, he is held responsible for any damage the animal may do by communicating the disease to other healthy horses. These are the principal responsibilities so far as damages are concerned, provided it is an ordinary contract to shoe a horse, but often the horse-shoer for the sake of business undertakes greater responsibility, he agrees to send for the horse, shoe it and take it back to the stable again safely. In that case he is liable in damages for any injuries the animal may receive in or out his premises. He may have redress from a third party, but he is directly responsible to the owner of the horse. It is as well to know this for it is getting a common practice, particularly in Glasgow, to send considerably over a mile for horses requiring to be shod. Parties, Mr. Anderson said, who practice this should for their own safety intimate to their customers that they will not be responsible for any injuries received by the horse. We are liable to a certain extent to our workmen who may receive injuries whilst in the exercise of their business. We may look upon the trade of horse-shoeing not only as one of the skilled trades, but as a hazardous one, therefore a workman is supposed not only to be skilled in his work but also smart enough to avoid the dangers he must inevitably expose himself to. However if a master persists in ordering a man to shoe a dangerous animal and the servant gets hurt, he (the master) is held responsible. It is true that the man can refuse to shoe certain horses, but should he refuse it is often at the peril of losing his situation, therefore cases have been decided, although not in the horse-shoeing trade, but in similar hazardous trades, that when a workman intimates to his master that a certain job which he may be sent to is dangerous, and if the master insists on the man going and executing it in the face of that danger, should the employé meet with an accident the master is held liable. It has been put forward in defending cases of this sort that the workman voluntarily undertook the danger, but the judges' opinion was "that the workman only undertook the job and also the danger being afraid he would lose his situation, and that the workman is expected to obey his master or foreman under the supposition that they have greater knowledge than he himself has." Mr. Anderson further spoke upon the advantages of the Employers Liability Act, which he went over in full explaining the details. In conclusion the speaker said that the calling of Master Horse-shoers was not a bed of roses, the responsibilities many and varied, and although they they do not often hear of an unfortunate fellow craftsman being mulcted in heavy damages, still, he knew that there were many claims made and also settlements come to which are never made public.

A hearty vote of thanks was accorded to the lecturer and the meeting was brought to a close.

FARRIERY SCHOOL AT GRATZ.

Among the general agricultural notes published in last number of the Journal of the Board of Agriculture the following is interesting. It is not very clear how the place is made to pay its way. The pupils seem to do a good deal of the work which is charged for.

"In 1842, an institution was founded at Gratz, in Austria, for the teaching of veterinary medicine and the training of practical farriers. This institution was closed in 1879 and reopened five years later as the present School of Farriery. One of the objections to the old institution had been that, owing to its dual functions, the class of instruction provided was inadequate to meet the requirements of the veterinary profession, and exceeded what was necessary for the practice of farriery. The school opened in 1883 is intended solely for the technical training of skilled farriers. Candidates for admission must have passed through an elementary school, and have served for at least two years as assistant

in a smithy. In 1894, there were 57 students, most of whom were between 20 and 25 years of age, though a few were under 20, and several were over 30 years old. Sleeping accommodation is provided for all the students, but they have to board themselves.

The school buildings comprise, in addition to the usual class rooms, a smithy with two forges, an anatomical museum, and a hospital for animals, the latter furnishing, on the one hand, the clinical material required for purposes of instruction, and, on the other hand, a centre for the rational treatment of sick and injured animals.

The teaching staff includes the director, who is a qualified veterinary surgeon; a teacher of farriery, also a qualified veterinary surgeon; a farrier; and three shoeing smiths.

The course of instruction is of twelve months duration, divided into two terms of six months each. The subjects of instruction are the anatomy and physiology of the hoof and foot; shoeing and manufacture of horse shoes; shoeing of abnormal hoofs and feet; recognition and treatment of diseases of the hoofs and feet; the diagnosis of infectious diseases of the horse; the diagnosis and first treatment of acute diseases of horses and cattle.

It is regarded as necessary that a farrier should be thoroughly acquainted with the symptoms of infectious diseases of the horse in order that he may be able to adopt the necessary measures to prevent the spread of infection when present in horses brought to his forge. It is also considered desirable that he should be able to render first aid in cases of acute diseases of animals.

Theoretical instruction occupies ten hours weekly, the remainder of the work is of a practical nature and includes seven hours clinical practice in the hospital each week.

As regards practical work done in the smithy, it may be mentioned that in 1894, 5,942 horses and 41 oxen were shoed at the school, and 18,971 shoes were made and fitted.

The examinations at the conclusion of the course extend to both theory and practice. In the practical examination every student is expected to make an ordinary horseshoe and a shoe for an abnormal hoof. He is also required to go through the entire operation of shoeing a horse, including the removal of the old shoe, the preparation of the hoof, and the fitting and putting on of the new shoe.

The theoretical part of the examination is for the most part oral, upon the different subjects taught during the course.

The school is supported by an annual grant of £100 from the Ministry of Agriculture, by a smaller grant from the local authorities of Gratz, and by the income derived from the smithy and the hospital.

Pedigree Pigs.—A "Lay" Inspector.

A large company assembled at Handley Farm, Belper, for the fourth annual sale of prize pigs, conducted by Mr. B. Johnson, auctioneer, of 47, Midland Road, Derby. The stock was the property of Mr. Isaac Beardsley, who has attained a world-wide reputation as a breeder of this animal. This strain is known as being very successful at most of the large shows in the country, and this season secured 16 first and 6 second prizes. Buyers were present from London, Sheffield, Ormskirk, and other distant places. From the list of prices realised it will be seen that the sale was a very good one, the competition in several cases being very keen. Prior to the sale the entire stock was inspected *by Superintendent McDonald, who certified that all the animals were from disease.*

[There must surely be some mistake in this account. No local authority—not even the Board of Agriculture—would accept a certificate of health from a policeman.—Ed.]

LOUIS PASTEUR.

Louis Pasteur was born at Dôle, in the Jura, on the 27th of December, 1822. His birth in an eastern department, and his subsequent professorship in the University of Strassburg, where he met and married his wife, may be held to account for the intensity of his anti-German feelings, which seemed a little out of place to one whose life was devoted to science. His patriotic passions led him to hand back during the Franco-Prussian war the diploma of Doctor of Medicine which had been bestowed upon him by the University of Bonn in 1868, and to refuse the honours proffered to him from Berlin shortly before the visit of the French fleet to Kiel. But with these exceptions he was content to show his patriotism by eclipsing his foreign competitors in the field which he made his own. His life was that of a student and a professor.

He owed his early training to the Colleges of Arbois and Besançon. From the latter he passed to the Ecole Normale. He was only 14 when he first tried for admission, coming straight from the provinces, and, instead of entering as he might have done, he preferred to study for another year, and was fourth in the competition of 1843. After a successful course of study under M. J. B. A. Dumas he took his degree as Doctor of Science in 1847, and was first an assistant and then full professor of chemistry at the University of Strassburg from 1848 to 1852. He spent three years in organizing the new School of Science at Lille, and then was called back to teach at the Ecole Normale, when he remained as director of studies until 1867. He was also successively professor of geology, physics, and chemistry in the Ecole des Beaux Arts, and professor of chemistry at the Sorbonne. In 1881 he become a member of the French Academy, succeeding Littré, and from 1887 to 1889 he was perpetual secretary of the Academy of Science. Thus there was little of place or dignity to distinguish his career from that of many less distinguished men.

But all the time he was engaged in the most successful discoveries, which he was able to make because he had the three great requirements of a scientific man, patience in experimental investigation, imaginative power, and the faculty for practical application. He began with studies of the polarization of light and its relation to the hemihedral forms of crystals. He discovered the facets on tartrate crystals, and what are called left-handed tartrates. These early studies are now chiefly interesting to the chemist and physicist, but they are worth noting for two other reasons. It is pleasant for Englishmen to remember that so long ago as 1856, when he had not yet found a permanent post in his own capital, the Royal Society of London gave him the Rumford medal for his researches in relation to crystals, and it is very probable that it was through his studies in this department that Professor Tyndall, who wrote the preface to the translation of Pasteur's biography by his son-in-law, which was published in 1885, was first drawn to him. The Royal Society added their foreign membership in 1869, and the Copley medal in 1874, but by that time his fame was more general. His early studies are also worth mentioning inasmuch as they may be called the germ, using the word in its unscientific sense, of his subsequent discoveries. He propounded the theory that molecular dissymetry, which is noticed when a beam of polarised light, is caused by certain solutions to rotate, was characteristic of living matter and its products. A German chemical manufacturer is said to have noticed that impure tartrate of lime fermented when dissolved in the light of the sun. This observation led Pasteur to discover a living ferment similar to the yeast plant which other men had noticed in alcoholic fermentation. He observed, too, that his

little organism would, under certain circumstances, select the right-handed rather than the left-handed tartrates, though the difference between them was physical, not chemical. This was his clue. He went on to show that other fermentations, such as that of milk, were also due to organisms. He found that putrefaction was to be traced to the same cause. The discovery soon began to yield practical results. He noticed the ferment of vinegar at work in a champignon, and was able to make many useful suggestions in relation to vinegar and wine diseases, and their cure; while a process known as the Pasteurisation of beer, by heating to 55 deg. centigrade, which he invented in 1872, is, we believe, used in all parts of the world. He had added the new word to the English language long before most Englishmen had heard of him.

M. Pasteur has done more than any man in this century, except Darwin, to revolutionise man's conception of nature. He had not a medical degree, and yet he has laid new foundations for medical science. He was trained early to rigorous scientific methods, and he was gifted with singular powers of observation. The practical applications of his discoveries were immediate, and it has been said that by his discoveries relating to anthrax Pasteur has increased the wealth of France by more than the war indemnity paid to Germany. The north of France is not only a centre of industry and mining, but also a country of brewers and distillers, and while at Lille Pasteur studied the subject of fermentation, with the result that he destroyed Liebig's doctrine, which was held by the last generation as one of the most fundamental and certain scientific truths. Pasteur showed that every description of fermentation was the work of a specific living organism. This led him to inquire into and destroy a "truth" which had been admitted ever since Hippocrates by scientists of all countries and ages. His denial of spontaneous generation was met, as might have been expected, with indignation. Like Darwin, he was alone against everybody.

He passed steadily upwards from the vegetable to the animal organisms. It was in 1865, at the suggestion of his master Dumas, that he began to inquire into the diseases of the silk-worm. French silk producers had been almost ruined, but Pasteur had never before even seen a silk-worm. He traced the germs of disease from egg to larva, from chrysalis to moth. The fact he noticed was that the disease only became manifest in the adults, and he concluded that unhealthy moths should be rejected, and that infection should be guarded against. In the seventies he turned his attention to anthrax, which was devastating the flocks of France. After experiments, during which he noticed that the temperature of the blood of birds was too high to allow the germ to live there, he was able to assure the Academy of Science in 1877 that he had found the bacillus anthracis. This was not all. He found a vaccine which gave immunity from the disease, and numerous experiments showed that vaccinated sheep were anthrax-proof. He passed in 1880 to a method of inoculation against what is known as chicken-cholera. Through all these years it is worth noting—that is to say, until he was nearly 60—the great savant, whose experiments on live animals have brought him some severe criticism, sought to alleviate the diseases of animals rather than those of men.

He had already, it is true, come nearer to the supreme task of alleviating human pain, through his researches into splenic fever, for anthrax occasionally attacks man as well as the brutes. But it was not until 1881 that he specially turned his thoughts to the prevention or cure of the most terrible of the diseases which animal can give to man. He studied a case of rabies in a child in the Trousseau Hospital, and was able after many experiments with rabbits to find a vaccine which would cure hydrophobia. The essence of his discovery was the application of the same system of attenuating the virus which he had used in the case of anthrax. It was, perhaps, chiefly wonderful because hydrophobia seemed to the onlooker so difficult to attenuate. The Academy of Science adopted his theory in 1886, and established the Pasteur Institute, which has, since it was opened in 1888, been the centre of his activities. He made it, through the aid of his Russian and other Correspondents, a rallying point for students of the morphology of microbes. It is perhaps too soon to say with certainty what degree of success he attained in the invention for which he has gained most cosmopolitan reputation. Figures are produced to show that he lowered the mortality from 40 per cent. to 1·3 per cent. of those attacked, but there is some reason to fear that the percentage of cures has been of late rather smaller. It is all the more necessary on that account to point out that the cure of hydrophobia is only one, and perhaps the least practically important, of his discoveries, and that he deserved long before it the reputation which has since been accorded to him by all nations. It is imposible yet to say whether other diseases, such as cholera, will also be prevented by the same method as M. Pasteur believed.

On the 27th July, 1870, Napoleon III. and M. Ollivier signed a decree, which happily never was promulgated, making him a senator of the expiring Empire. In 1892, he received a more real honour in the celebration of his 70th birthday under the presidency of M. Carnot, in the presence of representatives of the chief scientific bodies of Europe. He had received all the reward his country could give him, and Europe will mourn with France at the death of one who was one of her greatest men. —*The Daily News.*

Horse Owners and the London County Council.

A meeting of the principal London horse owners was held on 30th ult., at Masonic Hall, Three Nuns, Aldgate, under the presidency of Mr. George A. Glover, to petition the London County Council to allow one-fourth of the value of glandered horses destroyed, as provided by the Board of Agriculture, instead of the £2 per horse granted at present. The resolutions were put to the meeting and carried, copies of the same being ordered to be sent to the London County Council and the Board of Agriculture. The resolutions were to the effect "That the Government returns of glanders show London to be the great hotbed and centre of disease; that this year there has been an increase of nearly two cases a week over last year; that the infection of studs of working horses is the misfortune of the owner, and the principle upon which suppressive measures should be based is that of pecuniary aid to horse owners combined with careful supervision of infected studs. That the powers possessed by the County Council are sufficient to suppress the disease, if adopted in their entirety. That payment of the full compensation provided by law would secure the co operation of owners of horses. It would decrease the cost to the ratepayers and ensure the suppression of the disease."

Death from Anthrax.

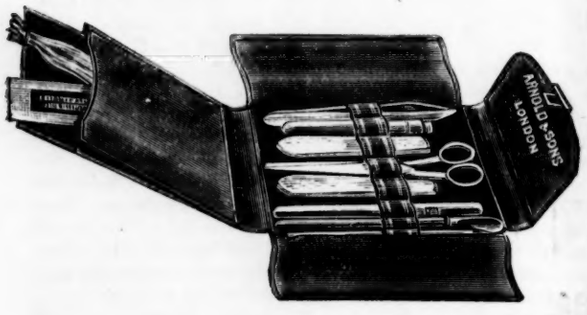
On Monday Sept. 30th, Mr. Arthur Langham held an inquest at Guy's Hospital on the body of William Henry Chester, fifty-nine, foreman at List's horsehair factory, Bunhill Row, who died on Thursday from anthrax, contracted under singular circumstances. The deceased had been in the employ of the firm for fifty years, and it was part of his duty to examine cargoes of horsehair from America, Germany, Australia, China, and Russia, and in this way caught the malady which caused his death. Mr. Arthur List, principal partner in the firm of List and Co. said he always examined the cargoes in company with

deceased. They had had two or three cases of anthrax amongst their employes, but never a fatal one. They had not the County Council notice indicating the symptoms of anthrax posted up in their factory. The Coroner: Well, it was not compulsory—By Mr. Pearce, for Mr. List: The symptoms of anthrax were a matter of common knowledge. On Sunday week deceased had complained of having a small pimple on his neck which his doctor told him came from a sting of an insect, but as it increased in size and he lost the use of his limbs he went to Guy's Hospital. An operation was performed upon him, but death took place on Thursday from Anthrax. Dr. Carpmael described it as a very virulent case, the anthrax bacilli being present in swarms all over the body. The jury returned a verdict of "Death from Anthrax."—*The Times.*

Regeneration of Nerve Centres.

At a recent meeting of the Académie des Sciences, M. Chauveau read a remarkable and important paper on the regeneration of the nerve substance. It is generally believed that the nerve centres are not regenerated after their destruction, but physiologists are not quite agreed on the point. Chauveau has put it to the test by removing the lobes of a monkey's brain, and producing total blindness. Four months afterwards the animal began to see, and several months later could move about. The operation took place on the 19th of February, 1893, and by the 24th of April, 1895, that is, in about two years, Chauveau opened the trepan holes by which he had removed the lobes and found that all the space formerly left empty, was refilled by a substance in which he recognised the presence of pyramidal nervous cellules and nervous fibres, in short, by a nervous substance.

The new lobes were not merely a fresh growth of fragments of the old lobes left behind, for the entire lobes had been removed. According to M. Chauveau, we have here a new fact, which demonstrates the possibility of nervous regeneration when the nutrition is conserved in the organ. A second operation was made, and the new lobes removed, and again after four months the monkey shows signs of renewed vision. The monkey is to be sacrificed when the new brain grows.—*The Globe.*



INSTRUMENT CASE.

The drawing here represented is that of an instrument case which had been made at my suggestion by Messrs. Arnold and Sons, of West Smithfield, London, and which I think deserves to be brought under the notice of your readers. The case has been registered as "The Student's Pocket Case," and is particularly intended for use at the Free Clinique.

The design of the case is a little different to that usually made, the flaps not folding over one another as is general, but opening something like a reporter's note book. It is specially made flat in order that it can be carried without inconvenience in the breast packet; it certainly occupies no more space than an ordinary pocket book, and contains a clinical thermometer, ebony caustic holder, Symes abscess knife, pocket scalpel (the handles of these latter two being flat and of white metal) dressing forceps, probe, director, needles, and suture silk. The price is £1 1s.

F. Hobday, M.R.C.V.S.

CORRESPONDENCE.

THE NATIONAL VETERINARY BENEVOLENT AND MUTUAL DEFENCE SOCIETY.

Sir,

In the current numbers of *The Veterinary Record* appears an account of the annual meeting of the above Society. I observe that in his address the President expresses surprise that "in a profession with upwards of 3000 members we should only number 165."

Will you kindly allow me a small space in your columns in order that I may express an honest opinion that two-thirds of the profession are in total ignorance as to the precise aims and objects of the Institution?

I was once present at a veterinary medical meeting at which some discussion anent this society took place, and in the course of which I asked to be furnished with a few definite particulars as to its objects. The reply I obtained was to the effect that I didn't read the professional journals or I should have seen the balance sheet which had been published the previous week. Well, sir, as a matter of fact I do read the professional journals regularly, and I have seen several balance sheets of the society, but I have never yet discovered even what the annual subscription is, nor have I ever been told what benefits I might anticipate in the event of my becoming a member.

I hope those who are connected with the Institution will not think me presumptuous when I give them my opinion that an unfailing remedy for their sorry membership roll is to be found in the expenditure of a small proportion of those funds which threaten to become "a hindrance in place of a help to the Society" in circularising every member of the veterinary profession, in order that each one may fully realise that certain benefits are offered him in return for a fixed annual payment. I almost begin to believe, should the present condition of agriculture continue, that benevolence will play an important part in sustaining many a M.R.C.V.S., let us then severally provide for a rainy day, or what is more probable, a veritable deluge; and this I am sure very many will do when the advantages of a Benevolent Society are laid plainly before them.—Believe me, your obedient servant,

Trevor F. Spencer, M.R.C.V.S.

Communications, Books, and Papers received:—Messrs. W. M. Scott, T. F. Spencer, J. Hewson, B. Freer, "Cyclop."

Original articles and reports should be written on one side only of the paper, and authenticated by the names and addresses of the writers, not necessarily for publication.

We shall be obliged by early intelligence of all matters worth bringing under the notice of the profession and thankful to any friends who may send us cuttings, from local papers, containing facts of interest.